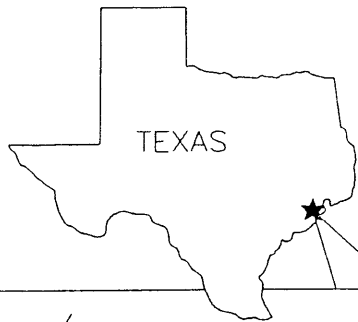
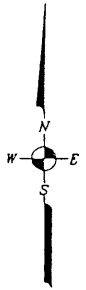


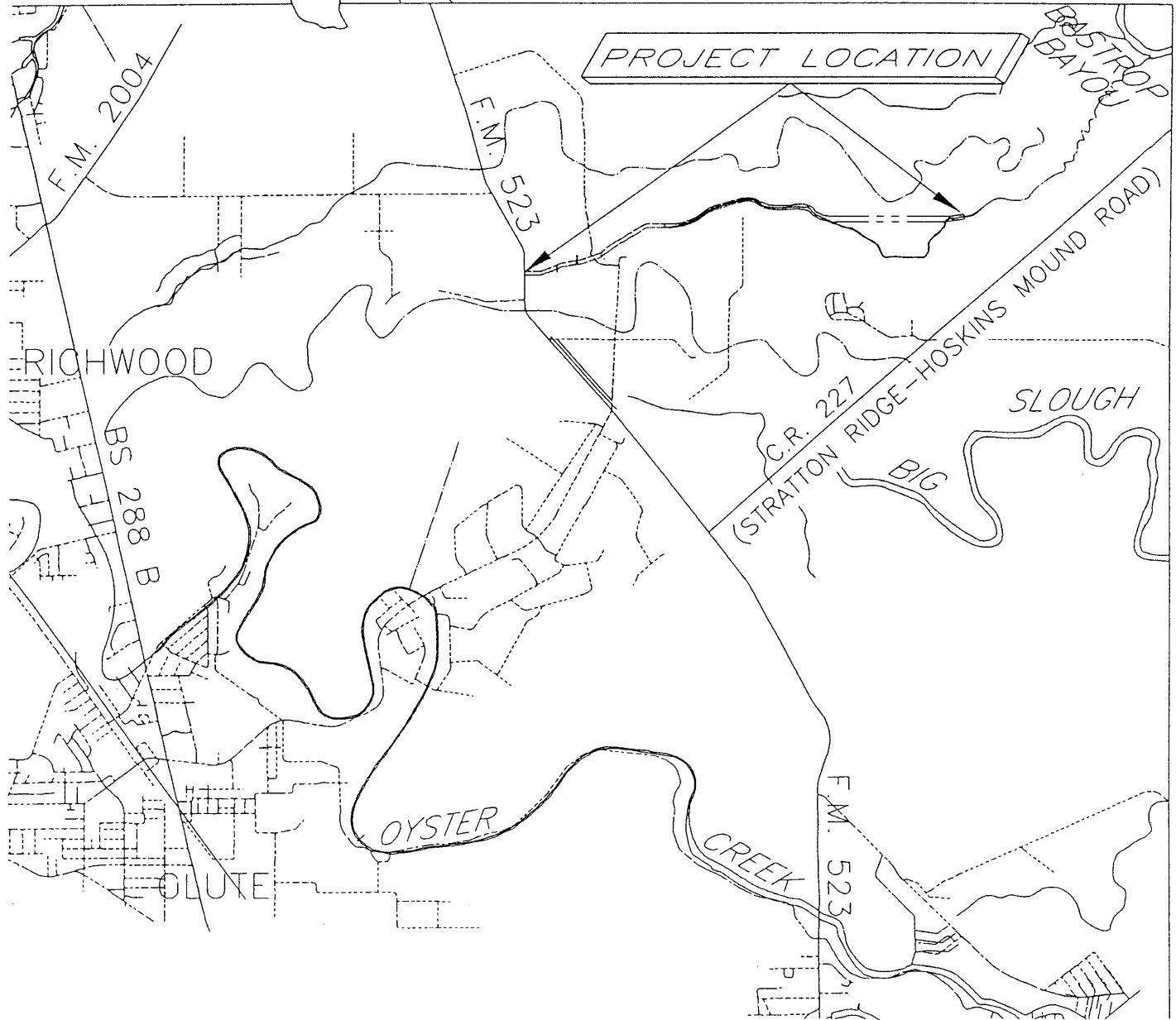
PROPOSED MOLLER DITCH IMPROVEMENTS VICINITY MAP



22658(01)
Velasco Drainage District
Sheet 1 of 15



NOT TO SCALE



PROPOSED MOLLER DITCH IMPROVEMENTS SHEET 1 OF 13

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:

Feb. 28, 2002 by C. H. Andrews
Nov. 19, 2003 by M. W. Brosi
Feb. 10, 2004 by M. W. Brosi

BERG & OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

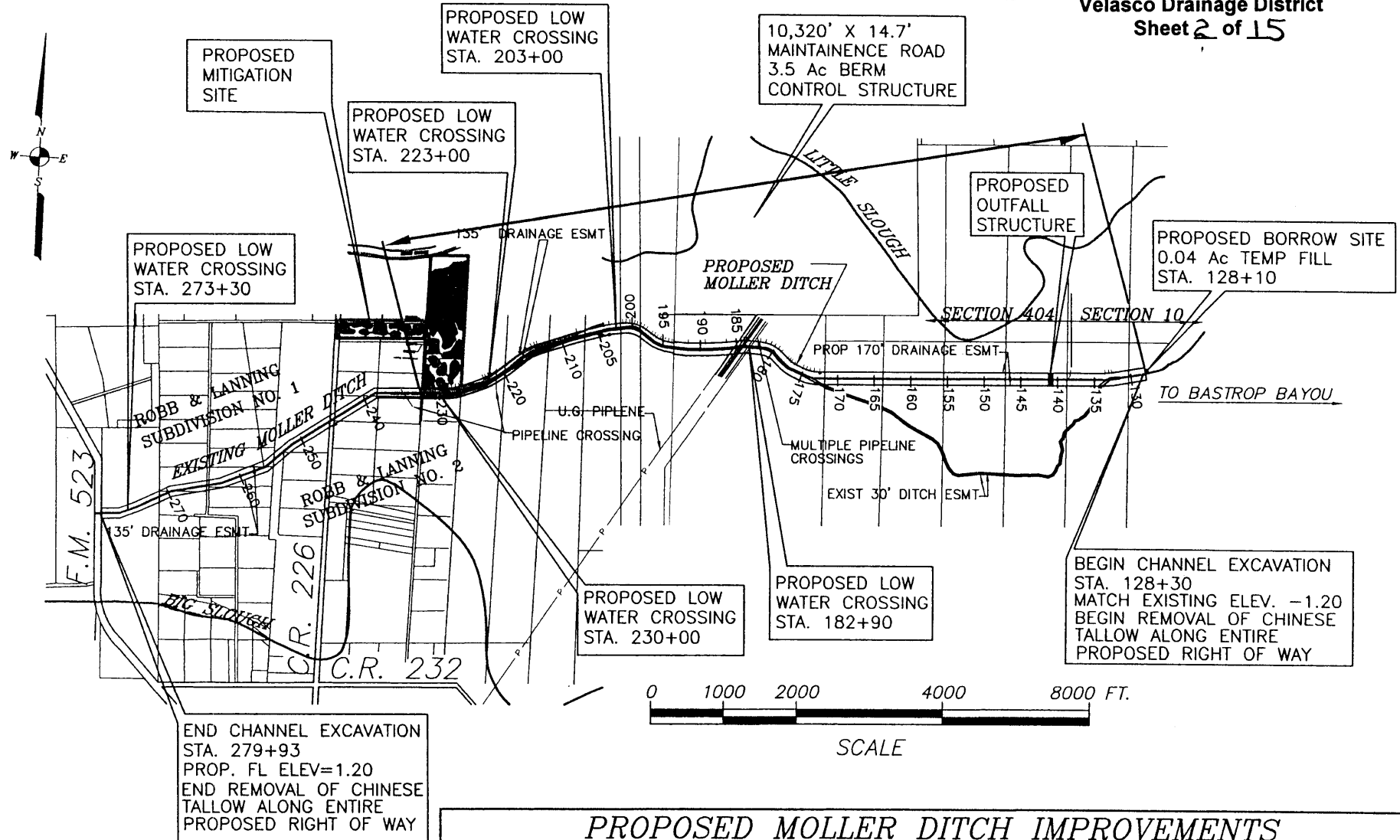
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>



PROPOSED MOLLER DITCH IMPROVEMENTS

PROJECT LAYOUT

22658(01)
Velasco Drainage District
Sheet 2 of 15



PROPOSED MOLLER DITCH IMPROVEMENTS

SHEET 3 OF 7

PERMIT APPLICATION NO. 22658
SHEET 3 OF 7

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:

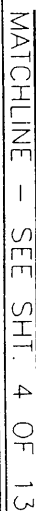
Feb. 28, 2002 by K. M. H.
June 24, 2002 by K. M. H.
Dec. 30, 2002 by C. H. Andrews
Nov. 19, 2003 by M. W. Brast

BERG•OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>

17 2004

BEGIN CHANNEL EXCAVATION
STA. 128+30
MATCH EXISTING ELEV. -1.20



NOT TO SCALE



15 - VERTICAL SCALE: 1"=5'

PROFILE

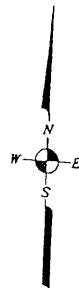
SHEET 3 OF 13

REVISIONS:
Feb. 28, 2002 by K. M. H
Nov. 19, 2003 by M. W. Bras
Feb. 10, 2004 by M. W. Bras

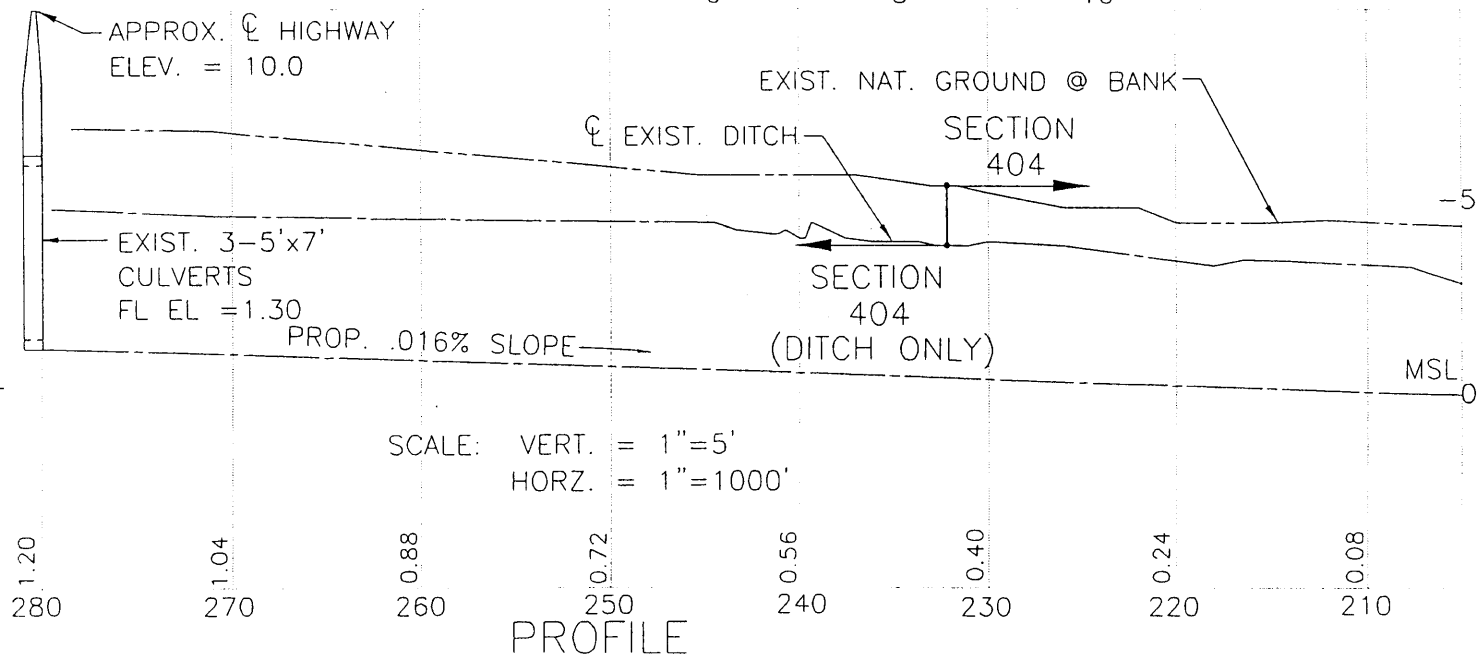
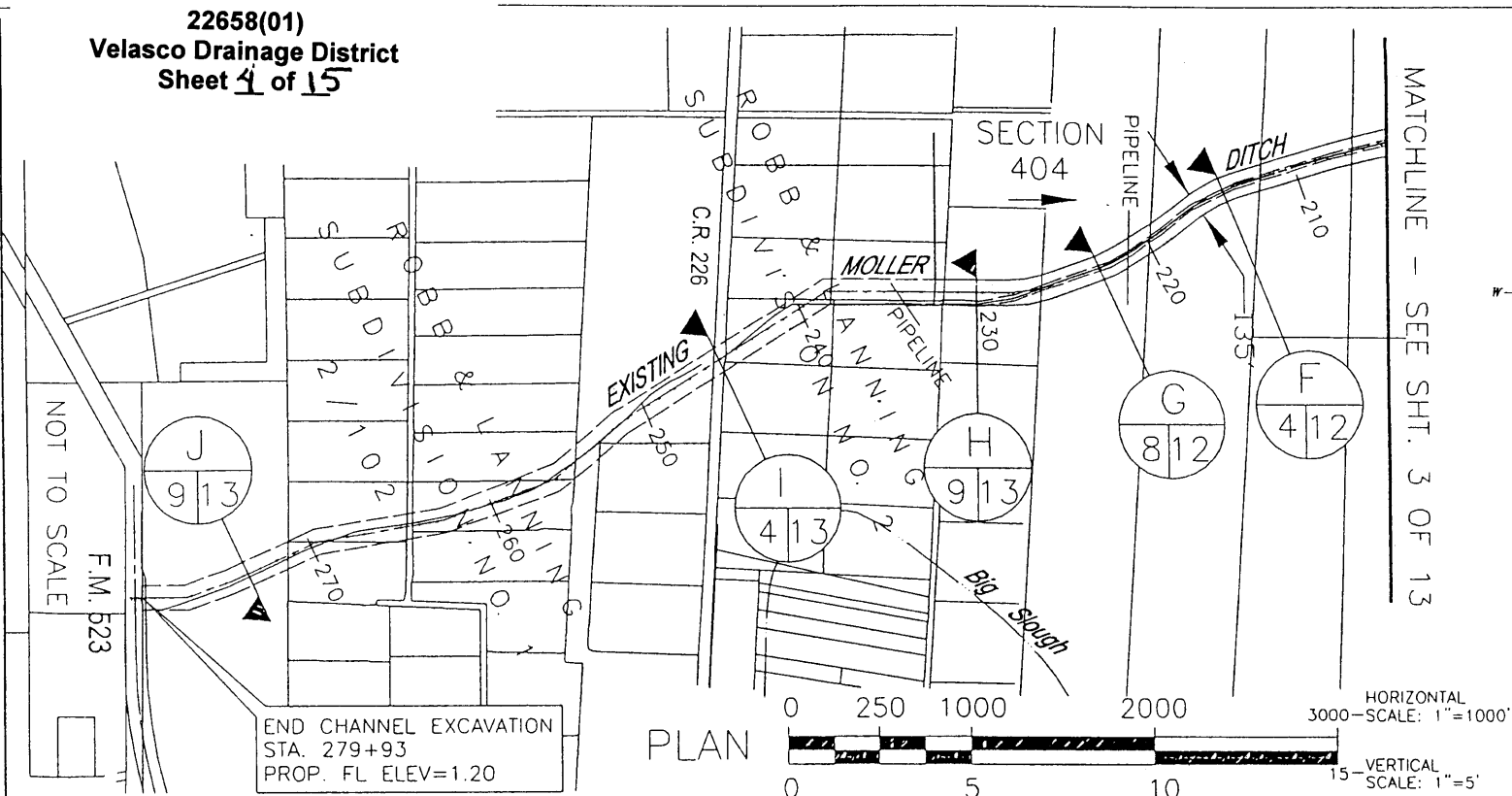
BERG•OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77078
PHONE (281) 569-0098 <http://www.bergoliver.com>



PROPOSED MOLLER DITCH IMPROVEMENTS PLAN & PROFILE



MATCHLINE - SEE SHT. 3 OF 13



PROPOSED MOLLER DITCH IMPROVEMENTS

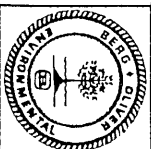
SHEET 4 OF 13

22658(01)
Velasco Drainage District
Sheet 4 of 15

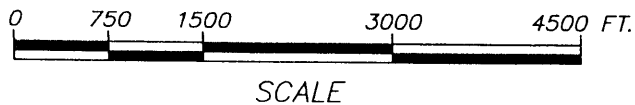
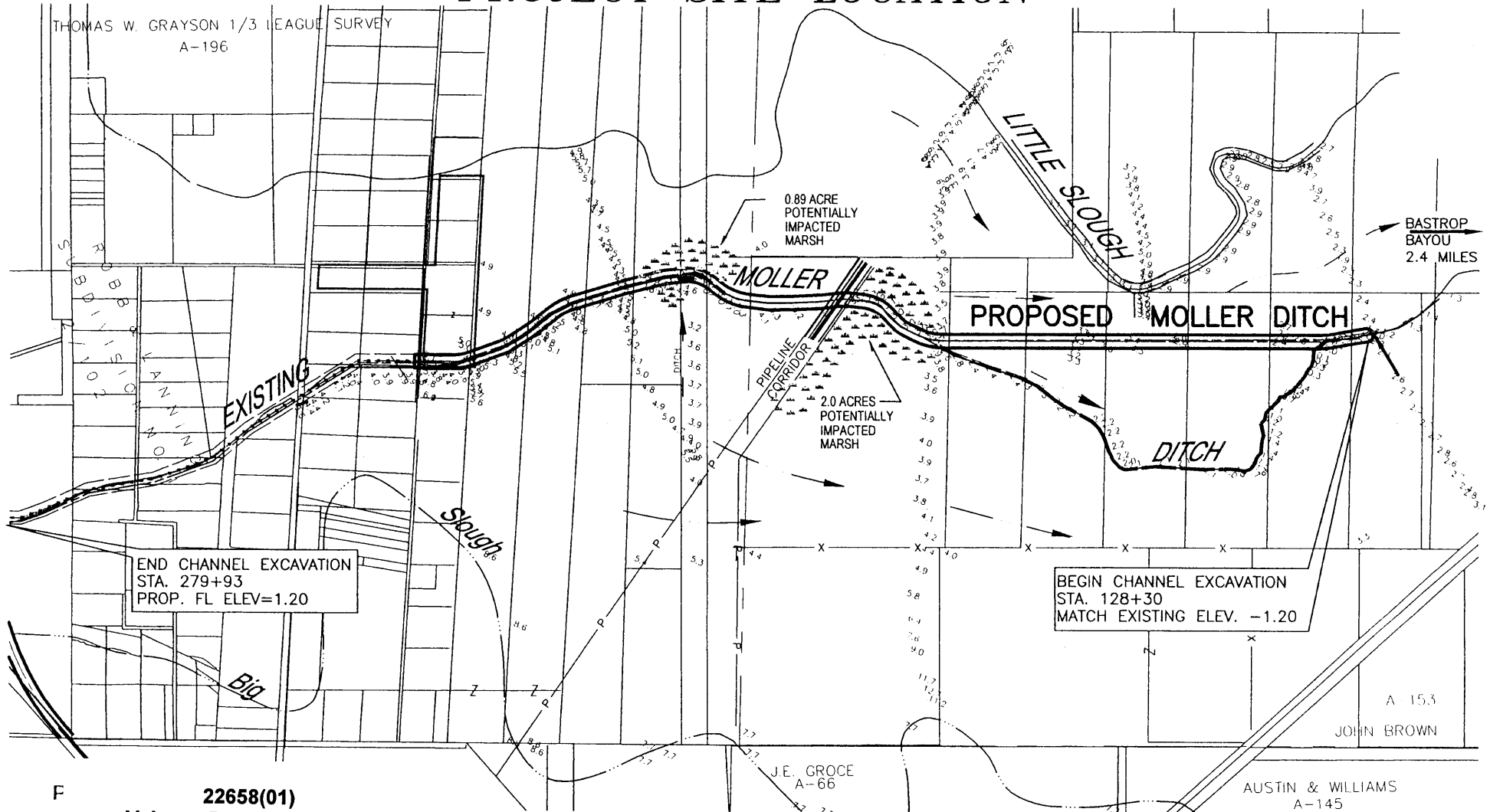
PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:
Feb. 28, 2002 By K. W. H.
Nov. 19, 2003 By K. W. H.
Feb. 10, 2004 By K. W. H.

BERG-OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 569-0898 <http://www.bergoliver.com>



EXISTING FLOW PATTERNS PROJECT SITE LOCATION



EXISTING FLOW PATTERNS PROJECT SITE LOCATION

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - C.R. 288
BRAZORIA COUNTY, TEXAS

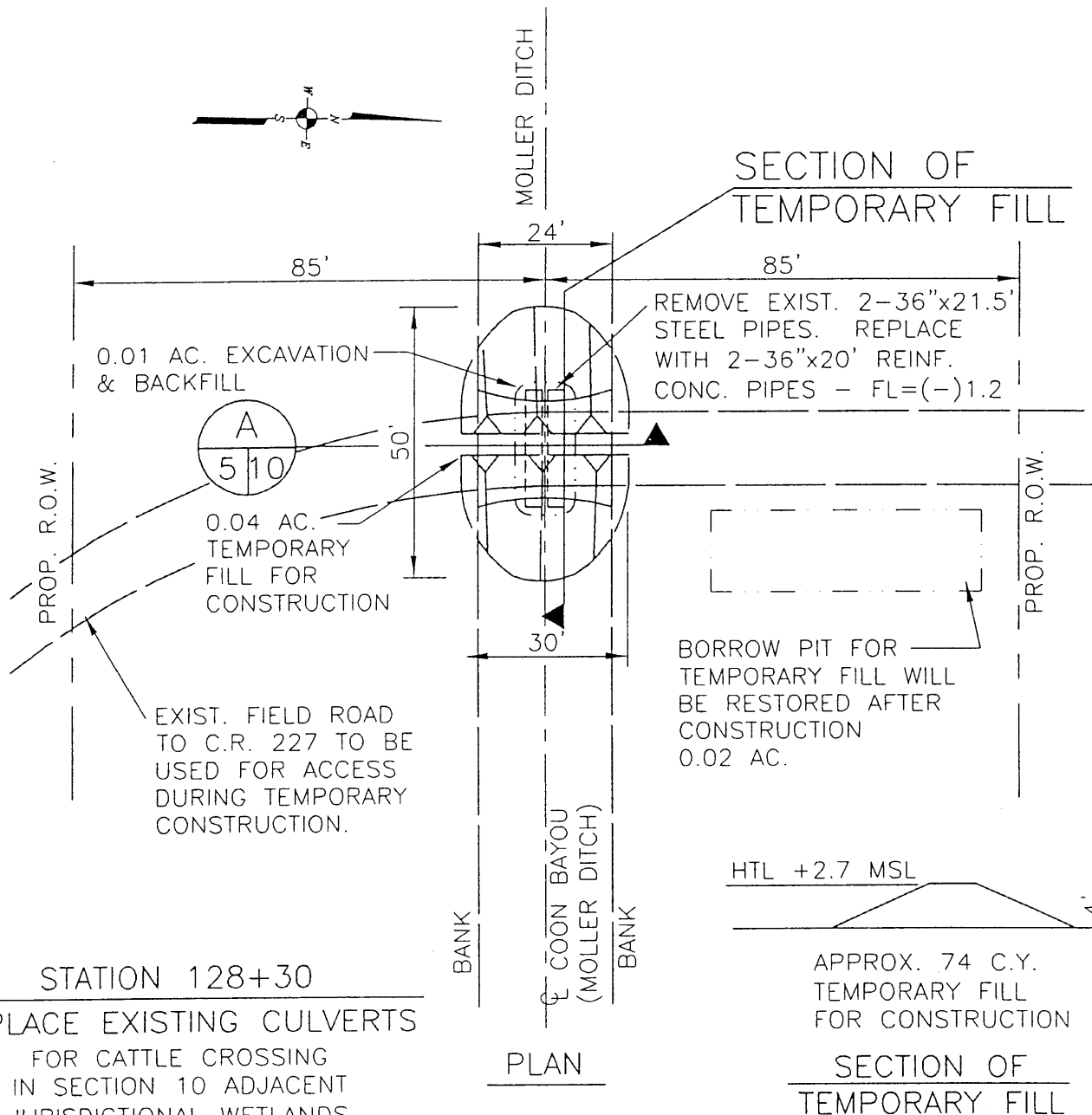
REVISIONS:

Dec. 19, 2003 by C. H. Andrews

BERG-OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>

PROPOSED MOLLER DITCH IMPROVEMENTS PLAN VIEW



22658(01)
Velasco Drainage District
Sheet 6 of 15

The boundaries of the jurisdictional areas identified on this map were defined and flagged by Berg+Oliver Associates, Inc. The boundary features are supported by field data records and surveyed by Boker & Lowson, Inc.

NOT TO SCALE

PROPOSED MOLLER DITCH IMPROVEMENTS SHEET 5 OF 13

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:

Feb. 28, 2002 by K. M. H.
Nov. 19, 2003 by M. W. Brost
Feb. 10, 2004 by M. W. Brost

BERG+OLIVER ASSOCIATES, INC.

ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

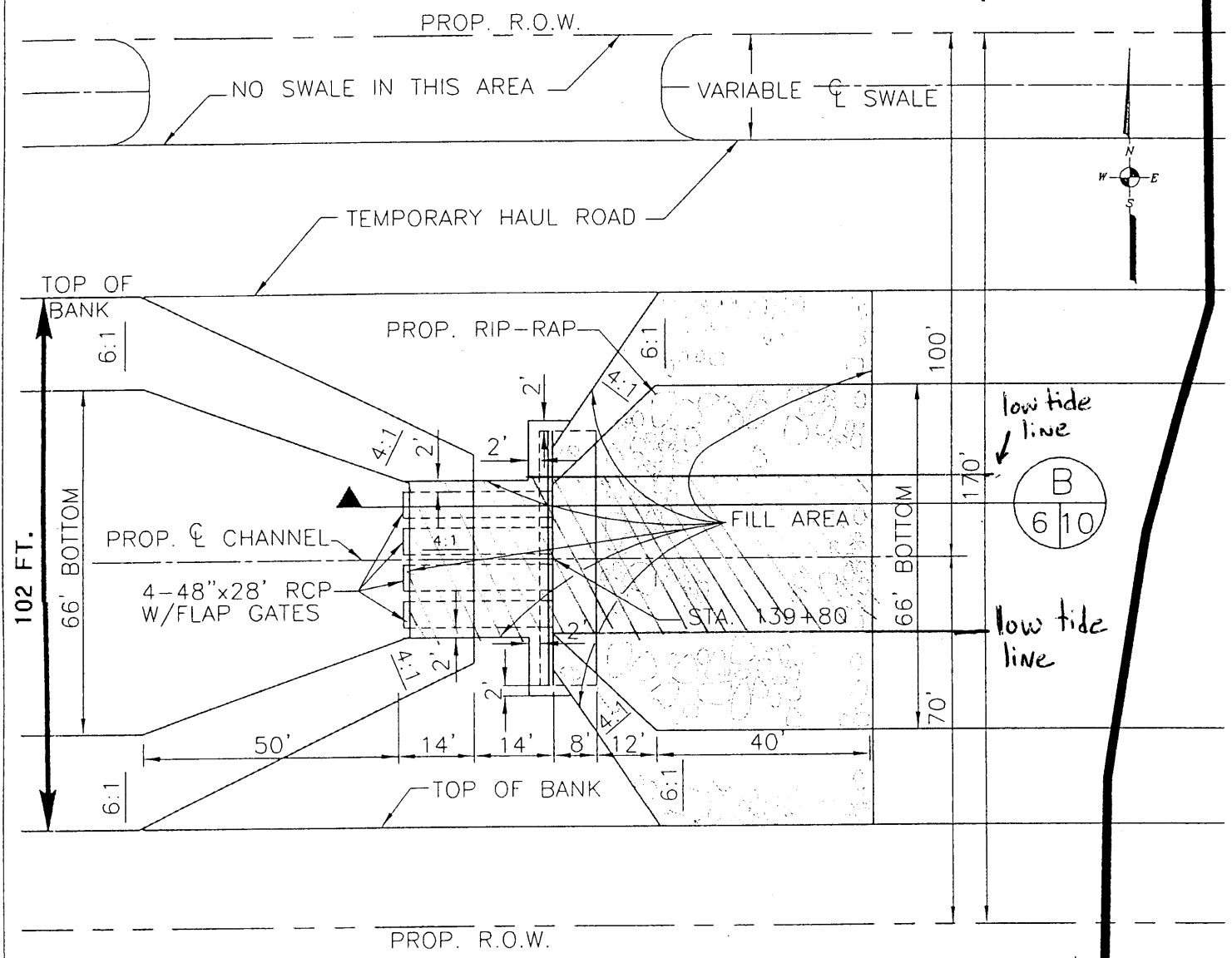
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>



PROPOSED MOLLER DITCH IMPROVEMENTS

PLAN VIEW

22658(01)
Velasco Drainage District
Sheet 7 of 5



PROPOSED OUTFALL STRUCTURE STATION 139+80

FILL AREA = 0.15 AC. - RIP RAP = 0.13 & 0.02 STRUCTURE FILL
WETLANDS IMPACT AREA = 0.15 AC. (Total)
0.058 Ac. (Below low tide)

NOT TO SCALE

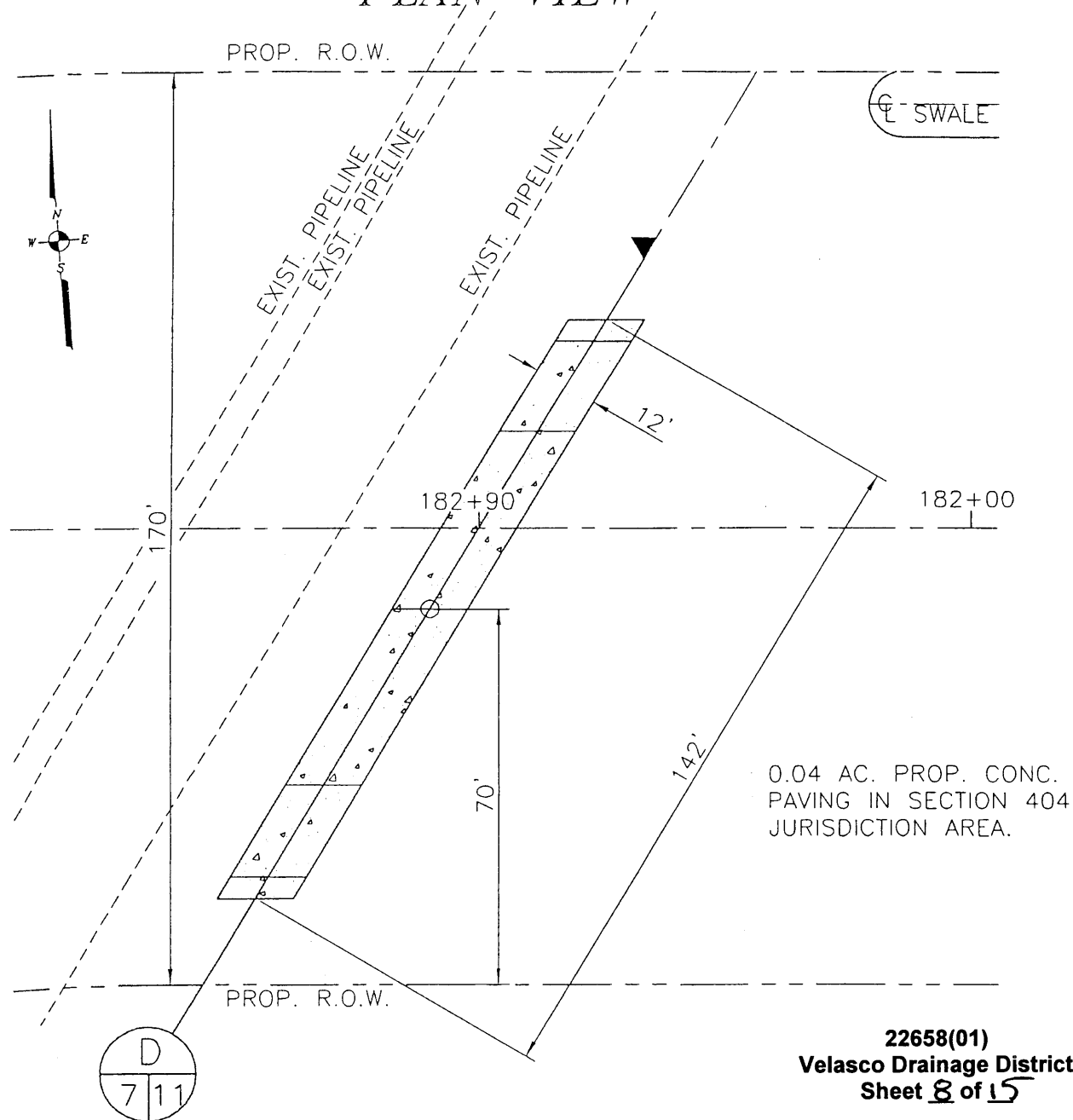
SECTION 404
SECTION 10

PROPOSED MOLLER DITCH IMPROVEMENTS

SHEET 6 OF 13

<p>PROJECT #: 3405PM01</p> <p>FOR: VELASCO DRAINAGE DISTRICT</p> <p>LOCATION: MOLLER DITCH - CR 226</p> <p>BRAZORIA COUNTY, TEXAS</p>	<p>REVISIONS:</p> <p>Feb. 28, 2002 by K. M. H.</p> <p>Nov. 19, 2003 by M. W. Brast</p> <p>Feb. 10, 2004 by M. W. Brast</p>	<p>BERG & OLIVER ASSOCIATES, INC.</p> <p>ENVIRONMENTAL SCIENCE, ENGINEERING & LAND USE CONSULTANTS</p> <p>14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079</p> <p>PHONE (281) 589-0898 http://www.bergoliver.com</p>	
---	--	---	--

PROPOSED MOLLER DITCH IMPROVEMENTS PLAN VIEW



22658(01)
Velasco Drainage District
Sheet 8 of 15

STATION 182+90
LOW WATER CROSSING

Typical plan view of all low water crossings.

NOT TO SCALE

PROPOSED MOLLER DITCH IMPROVEMENTS SHEET 7 OF 13

PROJECT #: 3405PM01

FOR: VELASCO DRAINAGE DISTRICT

LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:

Feb. 28, 2002 by K. M. H.
Nov. 19, 2003 by M. W. Brast

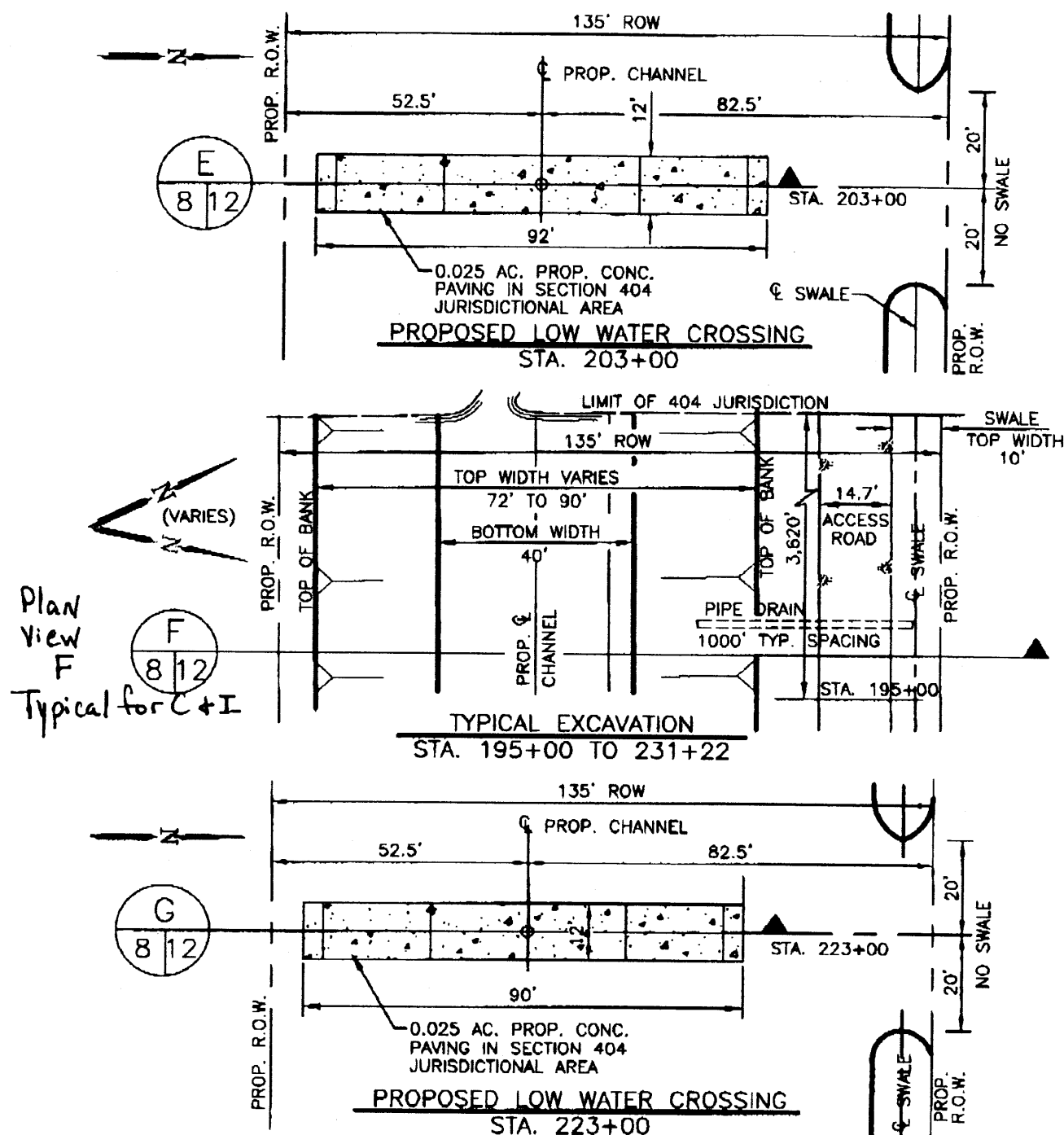
BERG & OLIVER ASSOCIATES, INC.

ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>



PROPOSED MOLLER DITCH IMPROVEMENTS



The boundaries of the jurisdictional areas identified on this map were defined and flagged by Berg+Oliver Associates, Inc. The boundary features are supported by field data records and surveyed by Baker & Lawson, Inc.

PROPOSED MOLLER DITCH IMPROVEMENTS

SHEET 8 OF 13

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:

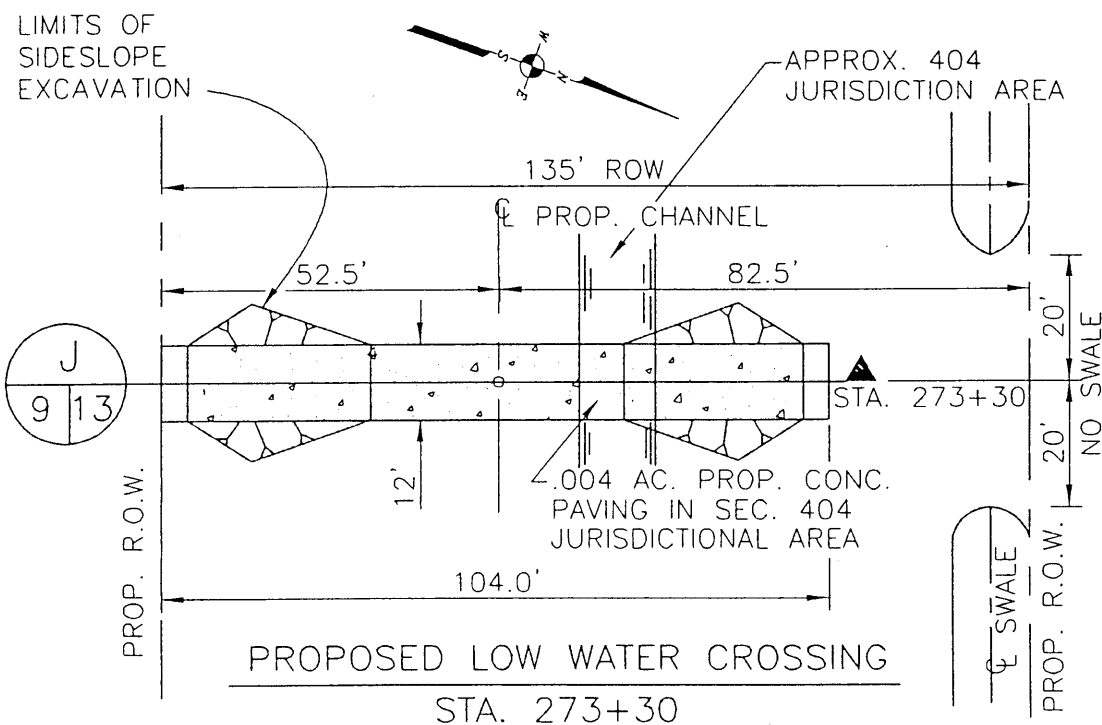
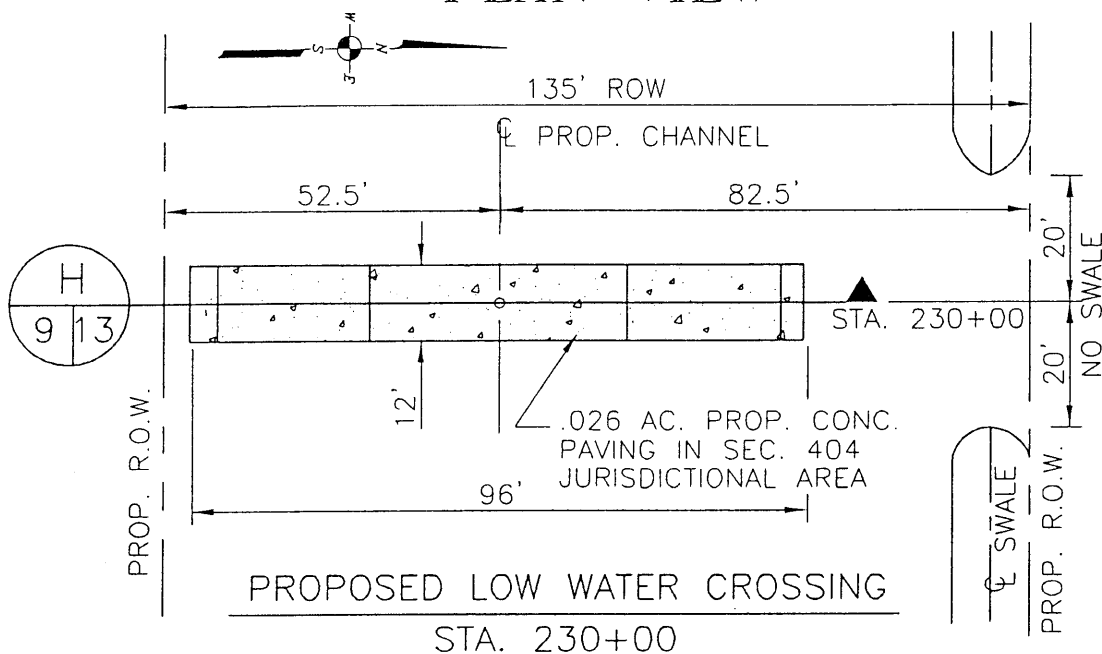
Feb. 26, 2004 by S. M. H.
Mar. 14, 2004 by S. M. H.
Feb. 10, 2004 by S. M. H.
Feb. 26, 2004 by S. M. H.

BERG+OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 689-0898 <http://www.bergoliver.com>



PROPOSED MOLLER DITCH IMPROVEMENTS PLAN VIEW



The boundaries of the jurisdictional areas identified on this map were defined and flagged by Berg+Oliver Associates, Inc. The boundary features are supported by field data records and surveyed by Baker & Lawson, Inc.

NOT TO SCALE

PROPOSED MOLLER DITCH IMPROVEMENTS SHEET 9 OF 13

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:
Feb. 28, 2002 by K. M. H.
Nov. 19, 2003 by M. W. Brast
Feb. 10, 2004 by M. W. Brast

BERG+OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>



22658(01)
Velasco Drainage District
Sheet 10 of 15

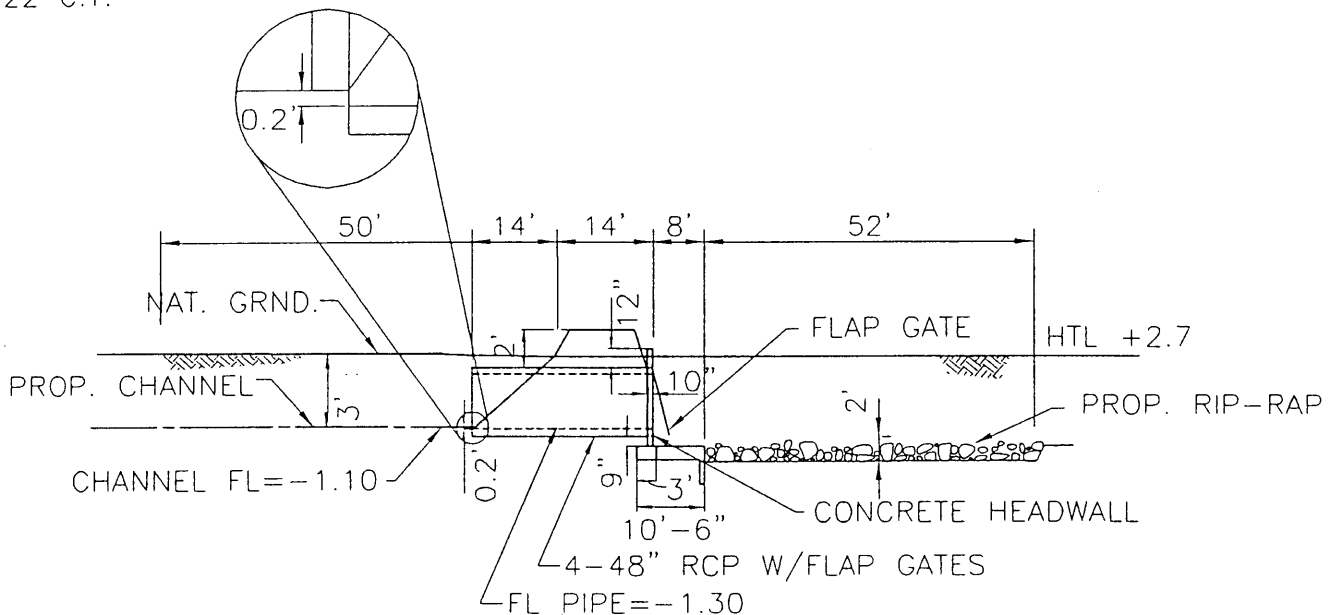
PROPOSED MOLLER DITCH IMPROVEMENTS

SECTION VIEWS

HTL +2.7
EXCAVATION BELOW HTL
REMOVE EXIST. 2-36"x21.5' STEEL PIPES. REPLACE WITH 2-36"x20' REINF. CONC. PIPES - FL=(-)1.2

A
5/10
EXISTING 36"x21.5' STEEL PIPES
STATION 128+30

EXCAVATED MATERIAL=22 C.Y.
FILL MATERIAL=22 C.Y.
MATERIAL BELOW HIGH TIDE
LINE=22 C.Y.



B
6/10
PROPOSED OUTFALL STRUCTURE
STATION 139+80
SCALE: HORZ=1"=30'
VERT.=1"10'

STRUCTURE

EXCAVATED MATERIAL = 42 CY
FILL MATERIAL = 50 CY
MATERIAL BELOW HIGH TIDE LINE = 42 CY

CHANNEL

EXCAVATED MATERIAL = 410 CY
FILL MATERIAL = 410 CY
MATERIAL BELOW HIGH TIDE LINE = 410 CY

22658(01)
Velasco Drainage District
Sheet 11 of 15

The boundaries of the jurisdictional areas identified on this map were defined and flagged by Berg+Oliver Associates, Inc. The boundary features are supported by field data records and surveyed by Baker & Lawson, Inc.

NOT TO SCALE

PROPOSED MOLLER DITCH IMPROVEMENTS

SHEET 10 OF 13

PROJECT #: 3405PM01

FOR: VELASCO DRAINAGE DISTRICT

LOCATION: MOLLER DITCH - CR 226

BRAZORIA COUNTY, TEXAS

REVISIONS

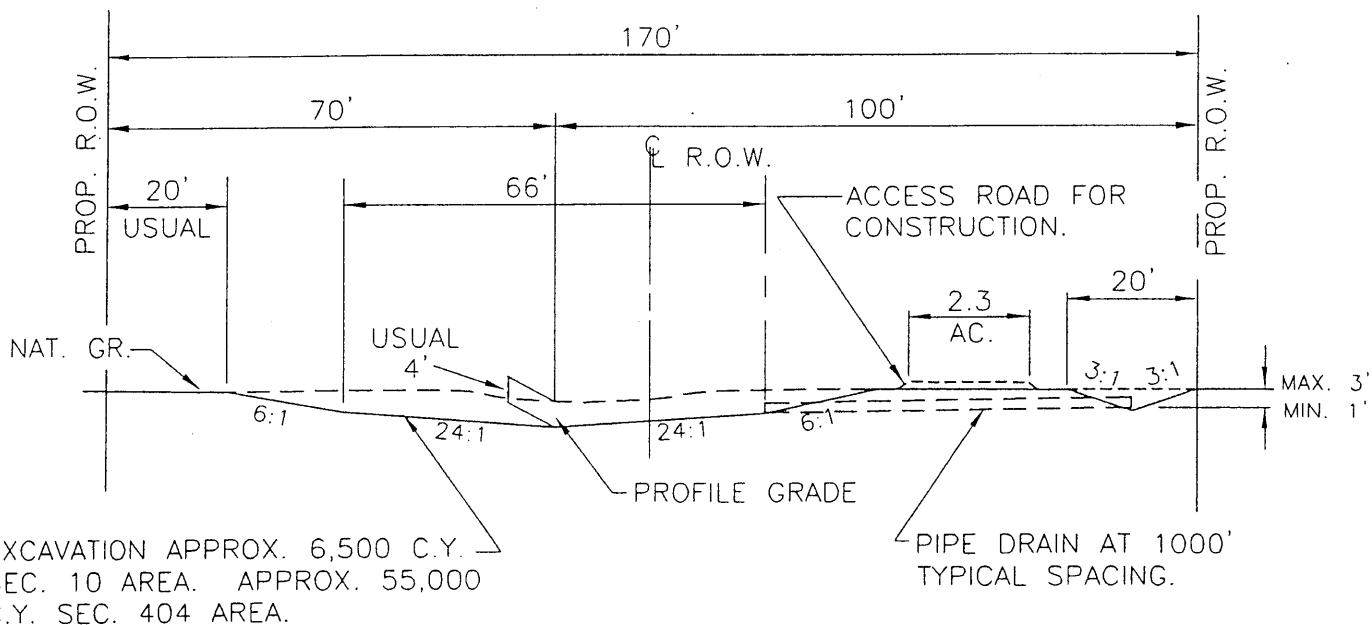
Feb 28, 2002 by K. W. H.
Feb 10, 2004 by M. W. Brast

BERG+OLIVER ASSOCIATES, INC.

ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>



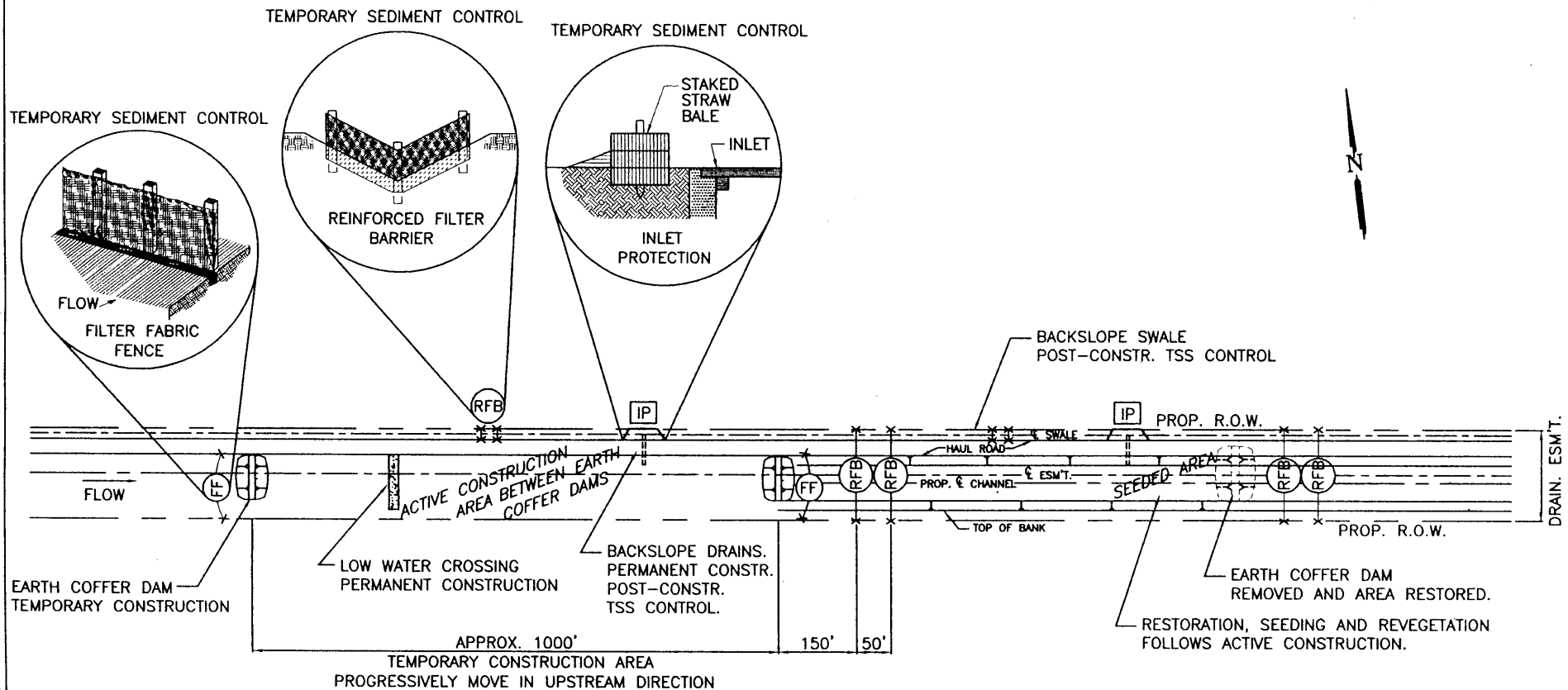




PROPOSED MOLLER DITCH IMPROVEMENTS

TYPICAL CONSTRUCTION SEQUENCE (WITH BMP'S)

22658(01)
Velasco Drainage District
Sheet 15 of 15



NO SCALE

PERMIT APPLICATION NO. 22658
SHEET 1 OF 1

PROPOSED MOLLER DITCH IMPROVEMENTS

SHEET 1 OF 1

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:

BERG OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 689-0898 <http://www.bergoliver.com>

VELASCO DRAINAGE DISTRICT – 28 ACRES – MITIGATION PLAN

The applicant, Velasco Drainage District is proposing to create and enhance off-site wetlands for the Moller Ditch Project. The created/enhanced wetlands will be located near the west end of the Moller Ditch Project. The wetland mitigation area will total 28 acres and consist of a 6.82 acres of created wetlands and 10.83 acres of wetland enhancement areas, the remaining acreage will be upland. In addition, the applicant is will provide on-site enhancement features along the entire project right-of-way through Chinese tallow removal and maintenance, as well as restoration of the channel (27.39-acres) through the replacement of topsoil along the entire channel and side slopes.

The wetland creation areas will receive the normal year to year rainfall, as well as the runoff water from the existing detention pond of the adjacent landfill. This will supplement the natural hydrologic regime and further increase the likelihood of achieving the minimum success criterion for hydrology. The wetlands were designed with interconnecting swales, which will allow the water to meander through all of the wetlands prior to being introduced into Moller Ditch. Furthermore, the created wetlands will incorporate water quality features which will allow for the settling of sedimentation and the filtration of pollutants prior to being expelled into the will Moller Ditch expansion project. The mitigation design is attached within the exhibits.

The 10.83 acres of wetland enhancement consists of the applicant transplanting hydrophytic vegetation to create a diversity of vegetation within the mitigation site. The transplanted vegetation will come from the Moller Ditch Project site, as well as off-site borrow areas. The borrow sites will be approved by Berg ♦ Oliver Associates, Inc. prior to the applicant placing them within the mitigation site, to determine they meet the criteria stated below.

The wetlands within the 6.82 acre wetland creation area will be designed and constructed within the following guidelines:

- 1) Depressions will be excavated to hold 6 to 12 inches of water at maximum capacity. The created wetlands will be designed to hold water seasonally from October to April, under normal conditions.
- 2) The wetlands will be planted with hydrophytic vegetation designed to provide habitat and a source of food for migratory waterfowl, shorebirds, and other wetland dependant species. The created wetlands will be vegetated with live plants, subject to availability, and may include, but are not limited to the following: swamp smartweed (*Polygonum hydropiperoides*); other *Polygonum* species; arrowhead (*Sagittaria latifolia*); marsh seedbox (*Ludwigia palustris*), sand spikerush (*Eleocharis montevidensis*), and other *Eleocharis* species. The applicant will attempt to include as many species as possible, depending on availability, from the attached plant list.
- 3) Planting criteria will take into consideration wildlife/waterfowl food production, habitat potential, affinity and success in the surrounding area, and availability of species indigenous to the area.
- 4) With regards to maintenance, the Applicant agrees to maintain the integrity of the wetland design so as to inhibit its degradation due to structural erosion during the monitoring period. In addition, the Applicant agrees to control invasion of noxious plant species in the created wetland areas. Noxious plant species referred to herein be defined as Chinese tallow (*Sapium sebiferum*), cattails (*Typha spp.*), and willow (*Salix spp.*) and will not exceed 10% areal cover of the mitigation area.
- 5) The mitigation site will be monitored on a quarterly basis for the first year following the completion of the constructed mitigation area. The site will then be monitored annually, not to exceed a period of five years.
- 6) The mitigation site will be considered to have met minimum success criteria if the mitigation site, for two consecutive years, meets 70% areal coverage of desirable

hydrophytic vegetative species which are considered FAC or wetter. Monitoring will cease once the mitigation site has met minimum success.

- 7) The mitigation area will be re-planted if 70% areal coverage is not sustained within two (2) years following the completion of the construction. Mitigation monitoring reports will be submitted to the USACE project manager and will include the following information: A) a summary of the percent ground cover and species composition at fixed pre- established observation points, B) list of dominant vegetation and their indicator status, and C) site photos.

Additional Mitigation Requirements

Wetland swales approximately 2-4 feet in width will connect one wetland to the next to allow for the water within the created wetlands to flow in an easterly to southerly direction and ultimately be discharged into the Moller Ditch expansion project.

As stated above, the runoff from the existing landfill facilities will be directed to the southeast toward the created wetlands via an existing pond, which will then enter the created wetlands through a culvert.

The 10.83 acre enhancement area will be planted with live hydrophytic vegetation to be transplanted from approved sites. All noxious species will be removed from the site prior to the plantings, and the noxious species will be monitored and maintained to keep them below 10% areal coverage of the site. The applicant will monitor the wetland enhancement areas until 70% of the planted vegetation has survived two consecutive growing seasons. If less than 70% of the planted vegetation survives two consecutive growing seasons, the applicant will replant additional vegetation to achieve at least 70% survival of planted species. The enhancement areas will be monitored on an annual basis following the completion of planting the hydrophytic vegetation. The site will be monitored annually, not to exceed a period of five years.

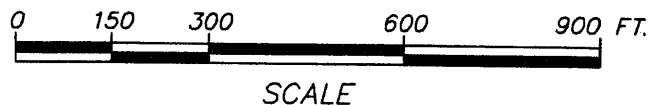
The applicant will stockpile topsoil from the project site and transfer back to Moller Ditch site upon completion of the construction activities to restore the channel and side slopes of the project. The borrowed vegetation for the creation/enhancement areas will be transplanted into the off-site mitigation areas prior to construction activities of the ditch expansion project.

PROPOSED PLANT LIST

Hydrophytic Vegetation: A mix of hydrophytic vegetation will be used to plant the created depressions and enhancement areas. The mitigation site will be re-planted if 70% aerial coverage is not achieved within two years following the completion of the construction. The following is a list of hydrophytic species to be planted (based on availability and is not limited to the following):

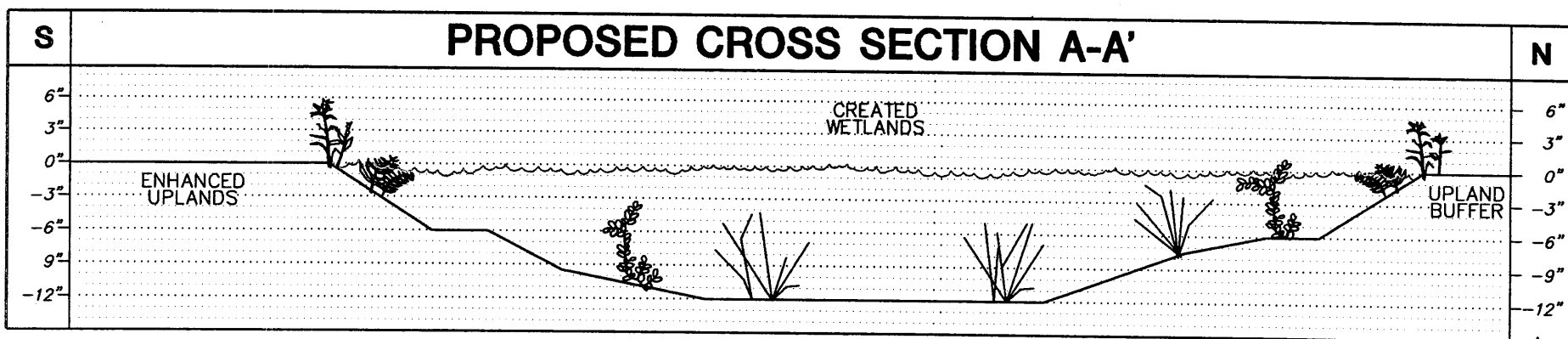
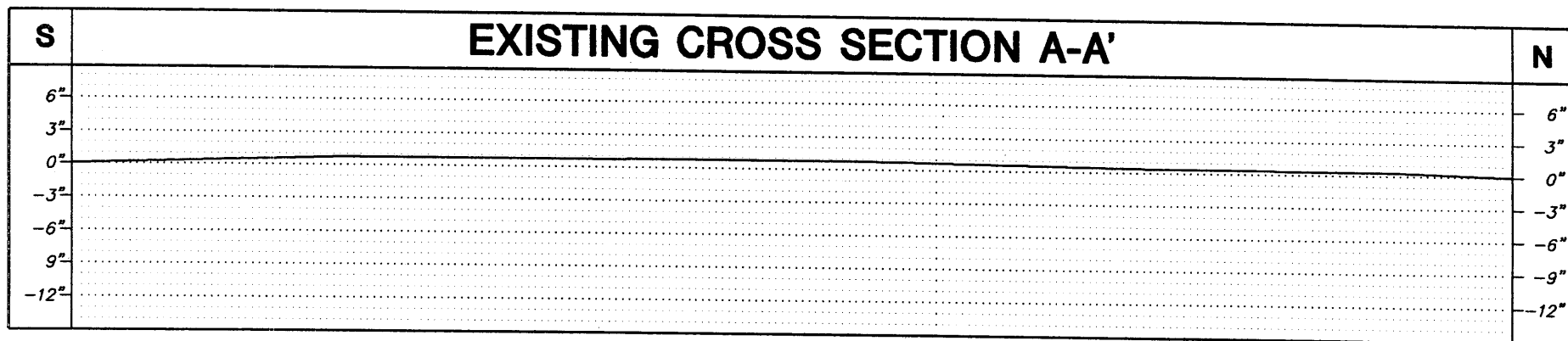
<i>Polygonum hydropiperoides</i>	swamp smartweed
<i>Juncus effusus</i>	soft rush
<i>Juncus diffusissimus</i>	slim-pod rush
<i>Ludwigia palustris</i>	marsh seedbox
<i>Cyperus diandrus</i>	umbrella plant
<i>Sagittaria latifolia</i>	arrowhead
<i>Eleocharis montevidensis</i>	sand spikerush
<i>Ludwigia peploides</i>	floating seedbox
<i>Eleocharis montana</i>	Dombey's spikerush
<i>Leersia hexandra</i>	club-head cutgrass
<i>Hydrolea ovata</i>	ovate false-fiddle-leaf

OCT 29 2003



OCT 29 2003

PROPOSED MOLLER MITIGATION SITE CONCEPTUAL DESIGN

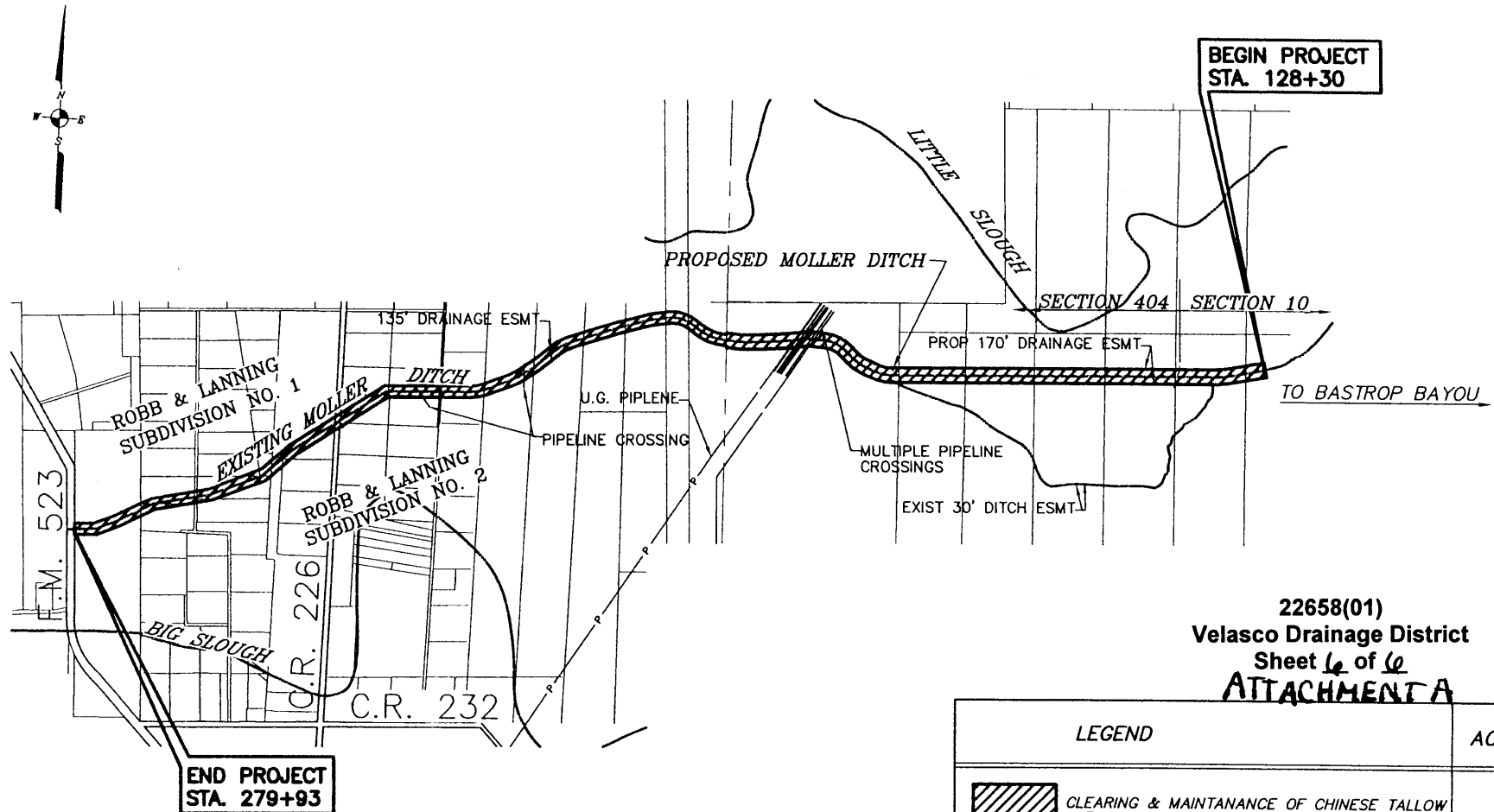


22658(01)
Velasco Drainage District
Sheet 5 of 6
ATTACHMENT A

NOT TO SCALE

TYPICAL CROSS SECTIONS		
EXHIBIT 2 OF 2		
PROJECT #:	4458WM03	BERG•OLIVER ASSOCIATES, INC. ENVIRONMENTAL SCIENCE, ENGINEERING & LAND USE CONSULTANTS 14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079 PHONE (281) 589-0898 http://www.bergoliver.com
FOR:	VELASCO DRAINAGE DISTRICT	
LOCATION:	MOLLER DITCH MITIGATION AREA	
	BRAZORIA COUNTY, TEXAS	
REVISIONS:		
Aug 22, 2003 by K. M. H.		

PROPOSED MOLLER DITCH IMPROVEMENTS MITIGATION PLAN



PERMIT APPLICATION NO. 22658
SHEET 7 OF 7

PROPOSED MOLLER DITCH IMPROVEMENTS SHEET 7 OF 7

PROJECT #: 3405PM01
FOR: VELASCO DRAINAGE DISTRICT
LOCATION: MOLLER DITCH - CR 226
BRAZORIA COUNTY, TEXAS

REVISIONS:
Feb. 28, 2002 by K. M. H.
June 24, 2002 by K. M. H.

BERG•OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE, ENGINEERING &
LAND USE CONSULTANTS

14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 <http://www.bergoliver.com>